

certainty for implementation of business plan, e.g., the amount of spectrum available to each licensee may decrease.

### **Public Interest**

The plan may impede implementation of systems due to difficulty in obtaining financing.

The plan may deter implementation of the approach which provides greatest potential capacity and flexibility for multiple entry and accommodation of new entrants and growth, and best facilitates international coordination.

### **Issues/Concerns**

#### **Coordination**

It may not be feasible to coordinate U.S. MSS systems until after launch, the time when spectrum assignment would be known. Indeed, because of the completion time involved, international coordination should begin as soon as possible.

The European Community, INMARSAT, or another entity may preempt U.S. in setting standard for MSS allocation, to the detriment of U.S. licensed systems.

#### **Continuing Disputes**

Because the proposed systems are of differing sizes and configurations in the space segment, there would be substantial debate concerning what constitutes an operational system eligible for assignment of spectrum. In this regard, consideration must be given to such measures such as anti-trafficking rules, known usage formulas that inhibit manipulation of traffic, and creation and strict enforcement of a milestone/progress report system.

Because no spectrum assignment is made, there may be a rush of applications to license small, expandable, or experimental systems which could provide operational service. The plan should not inadvertently favor one type of business concept or one type of orbital satellite system by establishing greater incentives for certain types of operational systems.

Because there would be no determination of spectrum assignment, there would be no guidelines for treatment of the next processing group.

#### **System Design**

Additional costs may be associated with constructing a system based upon an "open" assignment of spectrum.

Additional costs and service degradation may be associated with reconfiguration of operating systems to accommodate spectrum reduction.

Public Interest

The 1610-1616.5 MHz band is proposed to lie fallow. Under most proposals presented in this proceeding some use is envisioned for this band.

Current disputes over spectrum policy and rules would continue in the coordination committee.

Success in marketplace (i.e., increasing need for frequencies to meet demand) may be penalized rather than rewarded because of inflexible spectrum assignment policy of 1/x MHz to each new entrant. Under full band sharing, frequency use may be based upon dynamic, market-driven band sharing.



**MOTOROLA INC.**

March 26, 1993

Via Hand Delivery &  
FedEx to Cleveland Office

Edward F. Miller, Ph.D.  
c/o Common Carrier Bureau  
Federal Communications Commission  
2025 M Street, N.W.  
Room 6218I  
Washington, D.C. 20554

Dear Dr. Miller:

In response to your request at the Negotiated Rulemaking Committee meeting yesterday, enclosed please find Motorola's views concerning the FCC/Facilitator's proposal and some of the objections that have been raised to that proposal.

Please do not hesitate to call me if you have any questions about our comments.

Cordially,

Michael D. Kennedy

Enclosure

cc: Mr. Thomas Tycz (via hand delivery)

**Motorola's Views Concerning the  
FCC/Facilitator's Proposal and  
Some of the Objections That Have  
Been Raised to That Proposal**

Motorola fully supports the guiding principles that underlie the FCC/Facilitator's proposal, and the approach outlined in that proposal. The proposal may need some fine tuning, but Motorola believes that the time to do so is during the opportunity for public comment on the Notice of Proposed Rulemaking that the FCC will issue following the issuance of a report by this Committee.

**A. Review of Stated Objections to the Proposal**

Most of the objections that have been raised to the FCC/Facilitator proposal are without merit, while others fail to recognize that the proposal represents only a framework for agreement, with the details to be filled in when the FCC issues its Notice of Proposed Rulemaking. The four sections of the proposal that received the most comment were:

- 1) The section that states licensees would not be guaranteed a defined amount of spectrum for operational purposes. (The proposal instead calls for a permittee to be supplied a

minimum amount of spectrum when the first satellite is launched, and more when the system is fully operational);

- 2) The section of the proposal that provides for reducing the amount of spectrum available to a system if additional systems are launched, or if assigned spectrum is not fully used;
- 3) The section that establishes a Standing Committee comprised of all operators that have received a license, have launched satellites and/or are operating;
- 4) The section that vests the Standing Committee with the authority to "make by mutual agreement under prescribed conditions the actual U.S. domestic frequency assignments to the satellite systems as they are launched," to act as a forum to "coordinate the use of the spectrum by these U.S. systems around the world" (recognizing that "the FCC remains the focal point for ITU coordination"), and, if a system is unsuccessful in using its assigned spectrum, to "reassign the excess

spectrum amongst the other satellite systems in accordance with appropriate usage criteria."

These sections were generally objected to on the grounds that they constitute an abdication of FCC authority, put off the "hard decisions" to the future, and assign those hard decisions to a committee that is unlikely to be capable of making those decisions effectively. It was also claimed that under the FCC/Facilitator's approach, applicants will not receive a guaranteed allocation of spectrum, and, as a result, will be unable to secure financing.

#### B. Response to Objections

Contrary to the views of the objecting parties, the FCC/Facilitator's proposal does not represent an abdication of FCC authority. Under this proposal, as Motorola understands it, the FCC will establish the formulas for determining the amount of spectrum to be assigned to each system that is launched, and to each system that is fully operational. The FCC will also develop the criteria for determining when a system is fully operational, and will develop the formula for reapportioning spectrum based upon usage. To the extent that these criteria and formula are not

fully set out in the FCC/Facilitator proposal, it is Motorola's understanding that they will be set out in the Notice of Proposed Rulemaking, and will be subject to sharpening and improvement in the comment period that will follow that Notice.

Nor does the FCC's proposal improperly postpone the "hard" decision of which applicant should receive how much spectrum. In the first place, the FCC will have made the decision as to the initial assignment of spectrum. The FCC will have established the guiding principle that no licensee receives spectrum unless it launches a satellite system and that a permittee will be assured of a minimum amount of spectrum if the permittee launches and begins commercial operations. The actual amount of spectrum received will depend on how many other systems are launched. The FCC will also, under this proposal, establish the appropriate usage formula for reassigning spectrum.

These are risks which can be assessed. It is no different than the uncertainty that exists under the full band interference sharing approach, where, although a permittee knows how much spectrum it will have if it launches, its capacity will be subsequently affected by the number of

other CDMA systems that launch and begin operating.

There is no reason to believe that the Standing Committee will prove incapable of making the decisions and performing the functions entrusted to it. In fact, the functions of the Standing Committee under the FCC/Facilitator's proposal are not significantly different from the functions of the committee that the objectors propose to establish to coordinate interference sharing under the full band sharing proposal. It is difficult to understand why one committee would be capable of functioning effectively, while the other would not.

In this connection, the Standing Committee will not be required to make extraordinarily difficult decisions. It will be reviewing data to determine if a system is "fully operational" under the FCC's definition of that term. It will be reviewing data to determine the system's "usage," again applying the FCC's definition. Assuming the FCC provides adequate definitions of these terms -- and initial inadequacies, if any, can be corrected later -- applying them should not prove an insoluble task.

Private coordination of the use of MSS satellite frequencies would



not represent a unique and untried leap into the unknown. The FCC has often certified frequency coordinating committees to select and recommend private radio frequency assignments. Appendix 1 consists of a list of such FCC certified frequency coordinators. Nor would this be the first time that the Commission has required satellite operators to work out their differences informally. Thus, for example, when the Commission established two-degree spacing for Ku-band satellites, it left potential interference problems to be resolved through informal coordination between FSS permittees and licensees, rather than through formal rulemaking procedures.<sup>1</sup>

To be sure, one consequence of that portion of the FCC/Facilitator's proposal which does not assign spectrum until an applicant has launched is that an applicant cannot sell unused spectrum to others. Avoiding such speculation would, however, appear to be one of the guiding principles of the proposal.

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<sup>1</sup> Report and Order in CC Docket No. 81-704, In the Matter of Licensing of Space Stations in the Domestic Fixed-Satellite and Related Revisions of Part 25 of the Rules and Regulations (Reduced Orbital Spacing) \_\_\_ F.C.C. 2d \_\_\_, 54 RR 2d 577, 590 (1983).

Finally, there is no merit to the argument that a provision is unworkable because it would require a fully operational system to reduce its spectrum if another system becomes fully operational, or if it fails to fully use all its assigned spectrum. Provisions for loss of spectrum have been successfully administered in other contexts. In the Private Land Mobile Radio Services, for example, the licensee of a trunked or conventional 800/900 MHz system may have some of its channels reassigned to another licensee from the same service category if certain loading requirements are not satisfied and no other channels are available in that area. See 47 C.F.R. §§ 90.631, 90.633.

### Conclusion

The FCC/Facilitator's proposal relieves the FCC of the necessity of passing judgment on the business risk and technical viability of the competing systems, while establishing a sound FCC framework within which the applicants have an opportunity to receive a license, and the marketplace can decide which applicants will survive.

While reserving its right to suggest refinements in the proposal at the appropriate time, Motorola now supports it as a valuable approach to

consensus. Motorola urges the FCC to utilize the FCC/Facilitator proposal as the basis for that portion of the Notice of Proposed Rulemaking governing spectrum assignment policies.

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## **APPENDIX 1:**

### **CERTIFIED FREQUENCY COORDINATORS**

**AS OF JANUARY 30, 1992**

**National Association of Business and Education Radio, Inc.**

**Associated Public-Safety Communications Officers, Inc.**

**Special Industrial Radio Service Association, Inc.**

**(now Industrial Telecommunications Association)**

**International Municipal Signal Association**

**Utilities Telecommunications Council**

**Manufacturers Radio Frequency Advisory Committee**

**Petroleum Frequency Coordinating Committee**

**Association of American Railroads**

**Telephone Maintenance Frequency Advisory Committee**

**American Trucking Association, Inc.**

**International Taxicab Association**

**American Association of State Highway and Transportation Officials**

**Forestry Conservation Communications Association**

**Forest Industrial Telecommunications**

**American Automobile Association**

**American Newspaper Publishers Association**

**Central Station Electrical Protection Association**

**Alliance of Motion Picture and Television Producers\***

**Special Emergency Frequency Coordination Committee\*\***

\* Operations are combined with Special Industrial Association, Inc.

\*\* Operations are combined with National Association of Business and Educational Radio, Inc.

TRW

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**MEMORANDUM**

March 26, 1993  
(via Hand Delivery)

**TO:** Ed Miller  
Facilitator

**cc:** Tom Tycx  
Fern Jarmulnek, Esq.  
Kristi Kendall, Esq.  
John Gilsenan

**FROM:** Roger Rusch  
Odyssey Program Manager  
TRW Inc.

Norman P. Leventhal, Esq.

**RE:** Concerns of TRW Regarding the Proposed  
March 25 "Elements of a Consensus" --  
Above 1 GHz Negotiated Rulemaking Committee

TRW hopes that the following paragraphs will assist you in evaluating the functionality and reasonableness of the proposal you have advanced. Initially, we note that certain basic principles should guide the Advisory Committee, and later the FCC, in making frequency assignment and licensing decisions for the new MSS services proposed by the applicants. These can be succinctly set forth as follows:

1. **Facilitate Service Competition.** The public interest is best served by providing for competition to ensure high quality service and attractive rates to users. The rules must realistically maximize entry.
2. **Enable Licensing of All Current Applicants.** The FCC should permit the marketplace to select the most attractive systems.
3. **Permit Future Entry.** The FCC must avoid providing exclusive use of the spectrum to any one applicant and thus preclude later entrants from access to the spectrum.
4. **Grant Unconditional Access to the Bands.** The FCC must attempt to provide the most favorable regulatory scenario to

enable the applicants to finance their systems and provide service to the American public at the earliest possible time.

5. **No Undue Burden on Any Single Licensee.** Certain portions of the subject spectrum are more difficult to use than others; all applicants should be afforded the opportunity to share the spectrum equally for successful operation.

6. **Any Sharing Approach Should Be Administratively Simple To Implement.** The FCC should not be required to continuously regulate use of the spectrum or be required unnecessarily to mediate disputes among applicants.

7. **Provide Full Access of the Spectrum By Operating Systems.** The rules should minimize the need for future FCC intervention if an operator fails to provide service; successful operators should be able to use the spectrum without going back to the FCC (or an organization delegated to act for the FCC) for further extended processes.

As you will note, these are not too different in scope than the goals outlined in your presentation yesterday. TRW, however, interprets their meaning and implementation in a considerably different fashion.

This Negotiated Rule Making (NRM) is considering rules and policies intended to engender a whole range of new services for the benefit of the American public and, at the same time, accommodate five applicants proposing spread spectrum CDMA and one applicant proposing bi-directional FDMA/TDMA. At present, there is no unanimity on the manner in which these twin objectives can be achieved -- but only because one of six applicants insists on maintaining a system design that is wholly incompatible with the others. The option outlined in "Elements of a Consensus" (EOC), however, merely begs the question and defers the necessary regulatory decision by authorizing the incompatible systems to proceed at their own risk and grant use of the spectrum on a first launched basis. While this may, at first glance, be appealing from a regulatory standpoint today, it is anti-Solomonic in that it "splits the baby" without regard to the public interest and good technical and regulatory policy. (For example, under the EOC approach, each system would have to be designed to accommodate a wide variety of frequency assignment decisions which are unknowable at the time of system design and construction.) While the EOC proposal on its face would appear to allow each system to be built without making changes in its system design, this feature alone can not form a basis for rational administrative decision making.

And there are many inherent and significant disadvantages to such an approach:

- The EOC assumes, contrary to the data established in the working groups, that spectrum segmentation is the appropriate solution to frequency assignments. Subdivision of a small segment of spectrum, however, is extremely inefficient because of the expected need to provide guard bands between incompatible modulation systems. This is not an idle concern; it results in a substantial loss of capacity for both adjacent operators.
  - The EOC is similar to the FCC's ill-fated and frequently criticized AM Stereo decision. The FCC must establish access standards before the marketplace will invest in a new technology.
  - Consumers will pay a substantially higher price for service because the systems will need to incorporate many additional features. These features include switchable filters in handsets, out-of-band emission "masks" built for all possible cases that will waste spectrum, and changes in ground station design to accommodate all possible spectrum assignments. These additional expenses would not be necessary if the FCC made a clear and unconditional decision at the outset.
  - The FCC, and the industry, will indefinitely have to carry the administrative and cost burden of the standing committee needed to re-regulate the frequency assignments as new systems are installed and their usage varies over time. This committee will also add to the cost to consumers, not to mention generate extended litigation whenever standing committee decisions are challenged by unhappy members.
- In this connection, valuable spectrum reassignments are placed under the control of competitors, without any statutorily mandated safeguards which have been available to all Commission licensees since the Communications Act was first promulgated almost 60 years ago.
- Systems will be very difficult, if not impossible, to finance because the initial assignment of spectrum to each licensee would be eroded by subsequent entrants in a totally unpredictable way. Investors simply are not accustomed to dealing with highly conditional business plans.

- Adding to the system licensees' (and their potential investors') uncertainty is the prospect of yet additional entrants at some future date, with the current applicants not knowing whether such future entrants will propose, and be licensed, to operate systems that are incompatible with those granted initial access to this band.

While Celsat states that only Motorola should be permitted, for example, to operate FDMA/TDMA, there is no assurance that other similar incompatible operations will not be proposed (e.g., AMSC) and accepted; some may even propose bi-directional operation, further complicating the prospects for successful operation by all entrants -- existing or future. The FCC has already announced, for example, that all current applicants will be given the opportunity to amend their applications to conform to the rules ultimately adopted.

- The EOC approach rewards the system already under construction (namely, AMSC) which can adapt its wing satellites to the new frequency bands very readily. This serves only to perpetuate the monopoly granted to AMSC in other portions of the L-band. As it would be the first user of these bands, AMSC would establish a de facto standard, and extensive redesign might be required for all subsequent systems, even if they went into service (i.e., were "launched") only a few weeks apart. AMSC would certainly assert rights to continue to occupy its spectrum in a manner conducive to its then existing operation; this, in effect, would work to exclude others if AMSC opts to use FDMA/TDMA as it now suggests it may do.

- Other Administrations have expressed strong interest in using this spectrum. Our delay in establishing access methodologies will allow them to dictate how the US will access this spectrum and INMARSAT will be given a golden opportunity to preempt the global market. INMARSAT has already initiated international coordination of this spectrum. We can not meaningfully coordinate with INMARSAT unless we know now how our systems will use the spectrum.

For example, coordinating the entire band for CDMA systems and the 1613.8 - 1626.5 MHz portion for FDMA/TDMA bi-directional systems will surely generate a response by other Administrations that the U.S. (like the Republic of Tonga in other contexts) is not seriously engaged in seeking to coordinate a real system -- and, unfortunately, they would be right.



Moreover, under the EOC proposal, it appears that coordination domestically among U.S. systems can not meaningfully begin until systems are launched -- a process tremendously wasteful of the licensee's orbiting assets and spectrum resource.

- If spectrum is split equally with each additional "n" entrant, this creates a potential for warehousing spectrum while a new entrant builds its business, and denies spectrum that may be needed for actual provision of service to on-line customers by an existing operating licensee. It also gives the first entrant access to the entire band when the operator (just getting started) only needs a small amount of spectrum, and reassigns it an increasingly smaller amount of spectrum just when the operator needs a larger amount. This unacceptably penalizes the successful operator, and its customers.

- Accordingly, the most significant problem from the perspective of the public using these MSS services is the continuing threat of loss of service, or severe degradation in quality, as band segments are adjusted to make way for additional entrants who may or may not be proposing access techniques which are compatible. In this same respect, this key aspect of the proposal will eliminate any possibility of utilizing wide-band spread spectrum systems (such as those proposed by TRW and others), thus losing many of the advantages of CDMA.

- Current experience with respect to some terrestrial services do not provide any meaningful guidance here. One simply cannot assume that the present employment of spectrum coordinating committees in limited cases, with limited spectrum prerogatives, is in any way analogous to granting a non-governmental body the authority to assign spectrum (and later take it away) for multi-billion dollar global satellite systems.

In addition to the foregoing, there are two fundamental issues which, in TRW's view, cast doubt on the legal validity of the entire EOC approach. First, there is a substantial argument that the FCC does not have the statutory authority to abandon its regulatory functions and delegate spectrum assignment tasks of this magnitude to a non-governmental entity, whether it be a Standing Committee of operators or a continuing Advisory Committee of the type now in place. See National Association of Broadcasters v. FCC, 740 F.2d 1190, 1200-01 (D.C. Cir. 1984) (the

Commission's "discretion is not boundless: the Commission has no authority to experiment with its statutory obligations") and Telocator Network of America v. FCC, 691 F.2d 525,552 (D.C. Cir. 1982) (court cautions FCC to take special care not to abdicate its responsibility to prevent ruinous competition); also see 47 U.S.C. §§ 155(c)(1), and 308, 309.

Second, there is the question of the legal status of the suggested Standing Committee, its charter (or articles of incorporation), by-laws, operating rules, member composition, civil liability for its actions, voting policies, funding, appeal of unresolved disputes, and a host of similar issues. By way of analogy, we understand that the AMSC consortium took over a year, and continued direct FCC intervention, to work out its internal arrangements -- and they were forced to agree to operate a single system. The precedential implications of this approach should be of grave concern to the Commission.

Finally, it is important to point out that this entire process has been necessitated by the intransigence of a single applicant -- Motorola -- which refuses at every turn to abandon any aspect of its initial design, notwithstanding that all other applicants have agreed on the manner in which they can equitably share the spectrum with each other (i.e., Full Band Interference Sharing; see MSSAC-23 and 24).

We hope that the foregoing is helpful to your assessment of the feasibility of the EOC. We would be pleased to discuss the matter further, and/or provide additional information or support for our views, if you think desirable.

Roger  
N.

**March 30, 1993 Proposal**

March 30, 1993  
Rev.1

**Elements of a Consensus**  
**Option A**

**Guiding Principles:**

**Equity** - All applicants have the opportunity to implement their proposed systems.

**Public Interest** - Public access to service. Universal coverage with maximum competition. No set asides for never-to-be implemented systems.

**Market Driven** - Each proponent can pursue its own business plan with no external prejudgment as to risk or technical approach. The market place decides if the approach is correct.

**International Interests** - Mechanism for taking account of non- U.S. systems and the international coordination of U.S. systems.

**Approach:**

1. All systems but Iridium are built to operate across the MSS bands in the uplink and downlink direction. Motorola should build to operate in the downlink throughout the 1613.8-1626.5 MHz band on a secondary basis and in the band 1610-1626.5 MHz in the uplink direction.

2. All systems will be licensed in the uplink direction across the band 1610-1626.5 MHz. All CDMA systems will be licensed across the 2483.5-2500 MHz downlink band. Motorola will be licensed in the downlink on a secondary basis in the band 1613.8-1626.5 MHz.

3. The conditional license authorizes an applicant to construct and to launch a satellite system. Coordination will be required with all U.S. operators and other foreign satellite operators before satellite launch and operation. Strict milestone schedules for construction and initial launch will be required. Each satellite operator will be required to launch one satellite within [3] years from construction authorization. The FCC will monitor the milestone schedule and determine whether the licensee can proceed with launch. The licensees will report periodically (6 month intervals after authorization) on the progress of their construction schedules.

4. An FCC recognized standing committee comprised of all licensees will be used as the forum to coordinate the use of the spectrum by these U.S. systems around the World. It is expected that the requirements of each U.S. system will vary around the world and this committee will be used to determine the amount of spectrum to be used by each of these systems around the world.

5. The standing committee will develop proposals to solve interference issues with other administrations' satellite systems operating in this band. These proposals will be used by the FCC to coordinate the use of the spectrum with the U.S. Government and, through the ITU regulatory process, with other administrations' systems whether satellite or terrestrial services. However, the FCC will remain the focal point for ITU coordination discussions with

satellite allocations at future ITU world radio conferences to satisfy the longer term needs of the MSS operators. Eligibility criteria to access these additionally allocated bands would be determined at the time the additional bands would be allocated domestically or when service rules are established for those new bands.

administrations' systems whether satellite or terrestrial services. However, the FCC will remain the focal point for ITU coordination discussions with other administrations and with the U.S. Government.

6. The FCC will make U.S. domestic frequency assignments to the satellite systems as they are launched. The 10.5 MHz (1616-1626.5 MHz) would be assigned equally between CDMA and FDMA technologies, with 5.25 MHz available for each technology in the United States subject to the appropriate coordination with any other administration's systems.

a. The FDMA systems will be assigned spectrum beginning from the top of the band (1621.25-1626.5 MHz). The first FDMA system launched would be authorized to operate within the entire 5.25 MHz. If subsequent FDMA systems are launched, the 5.25 MHz will be divided equally among the FDMA systems. The CDMA satellite system will be assigned an amount of spectrum equal to that available to the FDMA systems beginning from the bottom of the band (1616-1621.25 MHz). If two or more CDMA systems launch, each would be authorized to operate within the same 5.25 MHz, thus pooling spectrum so that frequency assignments would be used in common by all CDMA operators.

b. If a second round of applications is permitted, the number of licensees could increase, but the maximum number of licensees operational would be  $n < \text{or} = \text{to } [6, 7, 8 \text{ or } 9]$  ?

c. If either technology does not develop, that is, if none of the licensees authorized to implement a particular technology has launched a satellite within [3] years of its initial construction and launch authorization, the FCC would reassign the excess spectrum for use by the successful technology. Similarly, if none of the licensees authorized to implement a particular technology has launched an entire system within [6] years of grant, the FCC may recover the excess spectrum and reassign it to the other technology.

7. The 1610-1616 MHz band would be made available in a common pool to all licensed CDMA operators in accordance with coordination agreements and depending upon the resolution of the Glonass issue.

8. Any pool of spectrum used by the CDMA operators could have some equitable sharing of interference power in the uplink and downlink direction as now being considered in the working groups. The standing committee could determine these values consistent with the ITU Radio Regulations and the operators' ability to seek agreements for values greater than these numbers as outlined by appropriate coordination agreements with other administrations. In cases of disagreement, the default values, as recommended by the Committee and adopted in the Commission's rules, would be followed.

9. The U.S. Government would seek to obtain additional spectrum for mobile satellite allocations at future ITU world radio conferences to satisfy the longer term needs of the MSS operators. Eligibility criteria to access these additionally allocated bands would be determined at the time the additional bands would be allocated domestically or when service rules are established for those new bands.

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**March 31, 1993 Viewgraphs**

March 31, 1993

ELEMENTS OF A CONSENSUS  
FOR MSS NRC

GUIDING PRINCIPLES:

- o EQUITY - OPPORTUNITY FOR ALL TO IMPLEMENT PROPOSED SYSTEMS
- o PUBLIC INTEREST - PUBLIC ACCESS - UNIVERSAL COVERAGE W/MAXIMUM COMPETITION
- o MARKET DRIVEN - EACH PROPONENT CAN PURSUE ITS OWN BUSINESS PLAN, W/O EXTERNAL PRE-JUDGMENT AS TO RISK OR TECHNICAL APPROACH, MAXIMIZE MULTIPLE ENTRY, MARKET PLACE DECIDES MERITS.
- o INTERNATIONAL INTERESTS - MECHANISM FOR TAKING ACCOUNT OF NON-U.S. SYSTEMS AND THE INTERNATIONAL COORDINATION OF U.S. SYSTEMS



(2)

### APPROACH

DESIGN/BUILD - ALL SYSTEMS TO OPERATE ACROSS FULL MSS UPLINK AND DOWNLINK BANDS.

MOTOROLA - FULL UPLINK BAND: 1610-1626.5 MHZ

DOWNLINK: 1613.8-1626.5 MHZ, SECONDARY BASIS

LICENSING - FULL UPLINK BAND: ALL SYSTEMS, 1610-1626.5 MHZ

DOWNLINK BAND: ALL SYSTEMS, 2483.5-2500 MHZ

EXCEPT MOTOROLA, 1613.8-1626.5 MHZ ON A SECONDARY BASIS

LICENSE - CONDITIONAL, FOR CONSTRUCTION AND LAUNCH.

COORDINATION REQUIRED WITH ALL U.S. OPERATORS AND OTHER  
FOREIGN SATELLITE OPERATORS.